



Research & Technology

# A New Standard for Standards

A Call to Industry for Data  
Interoperability

Presented to the DMSMS Conference  
27 October 2010, updated 12 April  
2011

Sr. Project Manager, Product Standards Office

# Our Standards Information Highway is not so Super

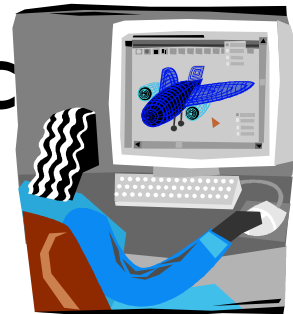
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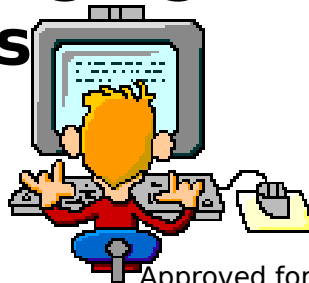
- **Standards Development Organizations still create documents**



- **But design is done in 3D CAD**



- **And cataloging and analysis are all done in databases**



# Interoperability Costs...

- **"\$16 Billion in waste due to a lack of interoperability between CAD, engineering, and software systems"**
  - **National Institute of Science & Technology (NIST)**
    - **August 2004**

# Data Interoperability

- **Today's and tomorrow's extended Corporate Enterprises operate with a mix of applications and Product Lifecycle Management (PLM)/Product Data Management (PDM) systems.**
- **The primary requirement of Network Centric Operations is to be able to integrate data across systems and environments.**
- **Accordingly, product data interoperability has become a central issue in Product development across the Product lifecycle.**

***AIA Engineering Management Committee (EMC)  
Engineering Data Interoperability Project 01/06***

# Interoperability Issues

- **Product Data Management (PDM) to PDM**
- Computer Aided Design (CAD) to PDM
- **CAD to CAD**
- **Computer Application to Computer Application**
- As Designed product structure integration
- **Configuration Management**
- **Document Management**
- Requirements to Analyses
- **Computer Applications to Program Management**
- **Any element of the product over the product lifecycle**
- Requirements to Requirements
- PDM to **Common Parts Library/Material Index/Libraries**
- **Library Integration**
- **Certifications**

*AIA Engineering Management Committee (EM)  
Engineering Data Interoperability Project 01*

# How Do We Improve Interoperability?

- **We just need to have our systems speak the same language**
- **In our case the language we need is a common way to describe parts and materials**
- **We'll call this a data model**



# To Describe Something, You Use A Data Model

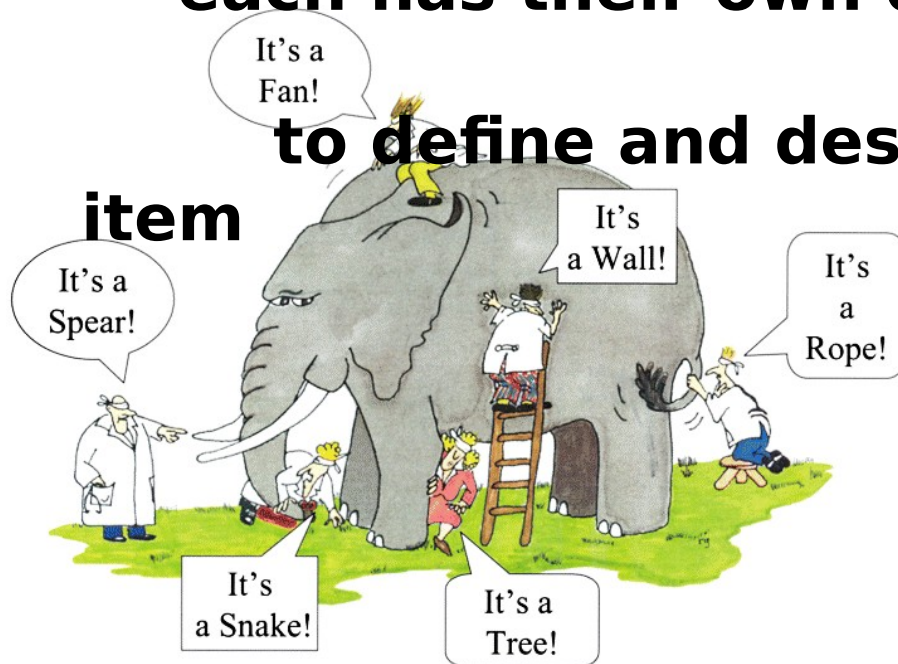
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**Every OEM, every fleet owner, every manufacturer, every distributor, every software company**

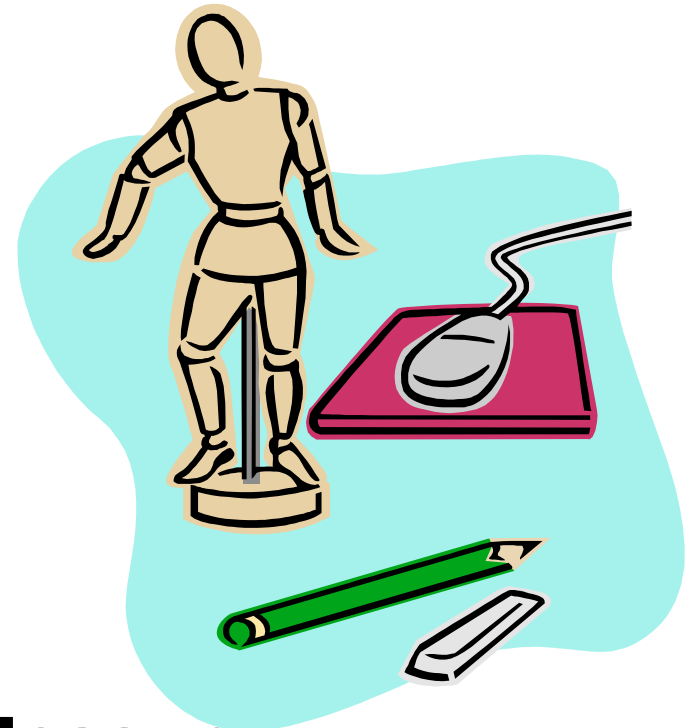
**each has their own data model**

**to define and describe the exact same item**



# What is a Data Model?

- **A method of describing a concept**
- **Usually involving a classification structure (tree)**
  - **Parts**
    - **Electrical**
    - **Mechanical**
      - Bearings
      - Fasteners
        - Bolts
        - Screws
        - Rivets
- **Attributes or Properties**
- **Valid Values and Units of Measure**
- **Dictionary of all terms**
- **Every decision is a source of cost and**



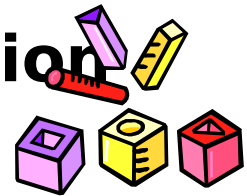
# A Necessary Evil

- **OEMs, fleet owners, manufacturers, distributors, and even software companies are not in the data model business**
- **We just want our data to get the job done**
- **So, for lack of a standard, we have all created our own data model**
- **And then spent \$ millions to load data into that format**
- **But only we know what that format is**
- **No one else can use our data**
- **We can't use anyone else's data**



# Square Pegs and Round Holes

- So now everyone up and down the supply chain has their own multi-million dollar database that is unique to their operation
- It does not match the data from your suppliers
- It does not match the data provided by your customers
- I can't give you my data
- And I don't want your mess
- And every new use for our data requires investments in changes to the data
- Now we have created a market for other people to come in and tell us how our data is and to clean it up for us

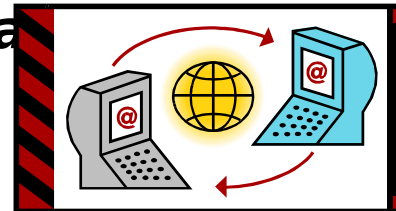


# Industries Thrive and Grow with Standards

**Examples: World Wide Web, VHS, HD, DVD, BLU-RAY, STEP, Cell Phones, Directories, Bar codes, HTML, TCP/IP, JAVA, USB, KML (Google Earth mapping language)**

***“If HTML had not been free, if it had been proprietary technology, then there would have been the business of actually selling HTML and the competing JTML, LTML, MTML products. Because we wouldn’t have had the open platform, we would have had competition for these various different browser platforms, but we wouldn’t have had the web. We wouldn’t have anything growing on top of it”***

**- (W3C)**



# This Industry Needs a Standard Data Model – STAT!

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- **None of us are in the proprietary data model business for common commodities**
- **And the lack of a standard data model hurts our ability to share data with suppliers, customers, and business partners**



# If You Build It They Will Come

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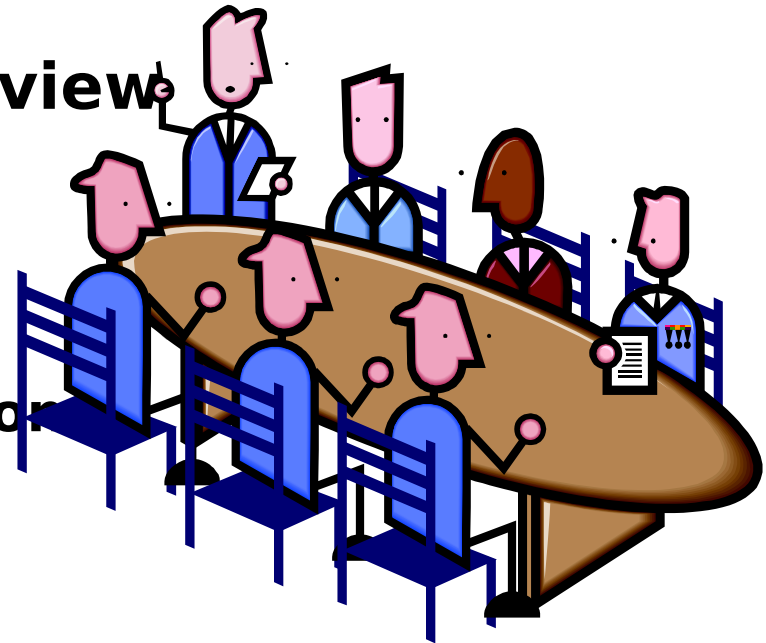
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- **If all my suppliers kept their data in my format...**
- **If my customer would get a lot of benefit directly from my data without converting the format...**
- **If I could send direct feeds to FLIS...**
- **If I could integrate GIDEP...**
- **If I could use existing CAD models...**
- **If I could do more with my data...**



# How to Get Started

- **Get an SDO that will sponsor the project**
- **Start with something pretty mature**
- **Pick a specific commodity (not all parts - just bolts)**
- **Get different points of view**
  - Cataloging
  - Design analysis
  - 3-D Geometry
  - Different industry OEMs
  - International participation
  - Competitors
- **Race to Share**



# Help Needed

- **April 12, 2011 update**
- **This is a request that the PSMC allow us to charter a subcommittee on the topic of Standards Data Exchange**
- **The subcommittee can take on a range of issues related to how standards data is used, integrated with, and passed along to CAD, PDM, MES, ERP, and cataloging systems from end-to-end throughout the supply chain**
- **Task 1: Work on a common data model for standard parts**

# Standards as Digital Data Workshop 5/3/2011

Sponsored by AIA Strategic Standardization Forum for

**Aerospace**

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- **Objective**

- This workshop is intended to provide a forum for the aerospace industry to discuss issues associated with moving to creating and delivering standards and standards data in a digital format. This includes standards generated 3D part models and tagged standards data intended to populate downstream applications. The workshop will allow representatives to meet and share with other companies, DoD agencies, and aerospace standards developers the issues surrounding implementation of digital standards. The forum will allow participants to provide a brief summary of their specific data modeling and tagging requirements and then find common ground for formulating the basis of an industry consensus set of requirements for standards as digital data. This meeting may be the basis for further follow-on activity.



- **Date / Location**

- May 3, 2011 (8:15 am - 5:00 pm)
- Raytheon Offices, Arlington, VA 22209-3901

- **Who Should Attend?**

- This workshop is open to representatives from aerospace companies or government agencies who are involved in working with standards and the generation of computer-based standards derived data (3D models, rule sets, tagged standards data, etc.). Companies are encouraged to send representatives in order to ensure that the deliverables from this workshop, which are intended to guide standards development in this area, represent the needs of all stakeholders.

- **Questions?**

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- **Register before April 28th**

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- **To be a recognized forum where the aviation, space and defense industry, in partnership with government, standards development organizations and all other relevant stakeholders can collaborate to:**
  - **Address and respond to aerospace standardization issues, opportunities, and challenges.**
  - **Provide visibility on standards activities to help prioritize and reduce duplication and proliferation of standards.**
  - **Promote robust, responsive, and responsible tools processes, and business models to support aerospace standardization.**
  - **Advocate globally recognized, accepted, and used standards which support international trade and the global business of aerospace.**
- **Provide education, awareness, and advocacy with**

- **Air Transport Association**
- **American Institute of Aeronautics and Astronautics (AIAA)**
- **ASTM International**
- **The Boeing Company**
- **Defense Standardization Program Office**
- **Federal Aviation Administration**
- **GE Aerospace**
- **Government Electronics and Information Technology Association (GEIA)**
- **Lockheed Martin Corporation**
- **National Aeronautics and Space Administration**
- **Northrop Grumman Corporation**
- **Rockwell Collins**
- **Rolls-Royce North America**
- **SAE International**
- **United Technologies Corporation**